Cummins Circular Economy

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This is Cummins

- Founded in 1919, Head quartered in Columbus, IN
- 73,600 Global employees
- $28.1 billion sales in 2022
- $1.2 billion R&D investment in 2022
- About 520 owned or managed facilities globally including over 140 manufacturing plants and technical centers

ELECTRIFIED POWER

FUEL CELL & HYDROGEN TECHNOLOGIES

Cummins' Environmental History: Legacy and Core Values

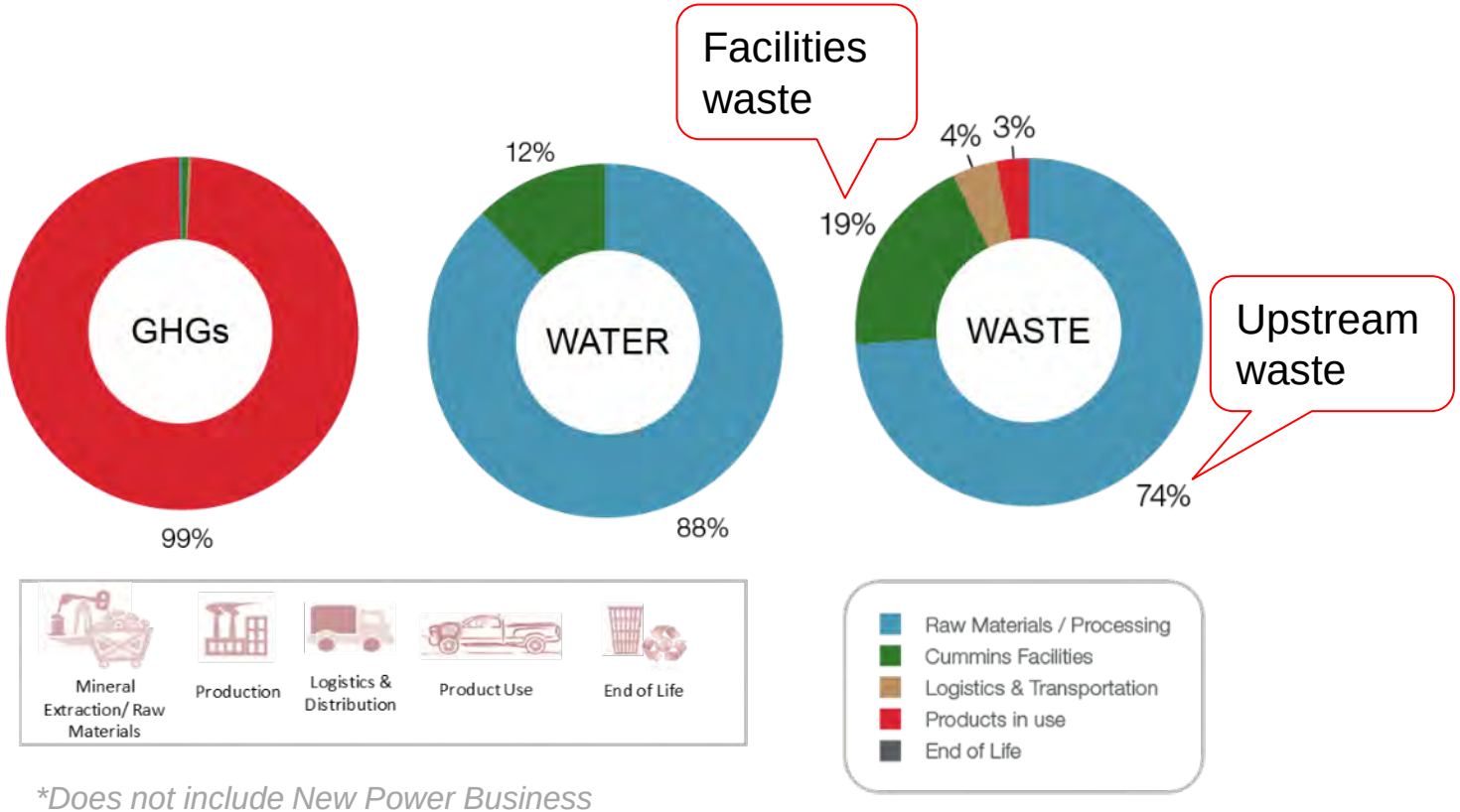
"…we believe that our survival in **the very long run** is as dependent upon responsible citizenship in our communities and in the society as it is in responsible technological, financial and production performance."

— J. Irwin Miller
Former Chairman and Chief Executive Officer, 1972

"Together, we will leverage our expertise to develop sustainable solutions that enable our customers' success, positively impact our communities and protect our planet for future generations."

— Jennifer Rumsey
President and Chief Executive Officer, 2023

Basis of Cummins Environmental Strategy



*Does not include New Power Business

Life Cycle Assessment & Hot Spot Analysis to understand Cummins Environmental Footprint

Knowing our impacts for informed strategy

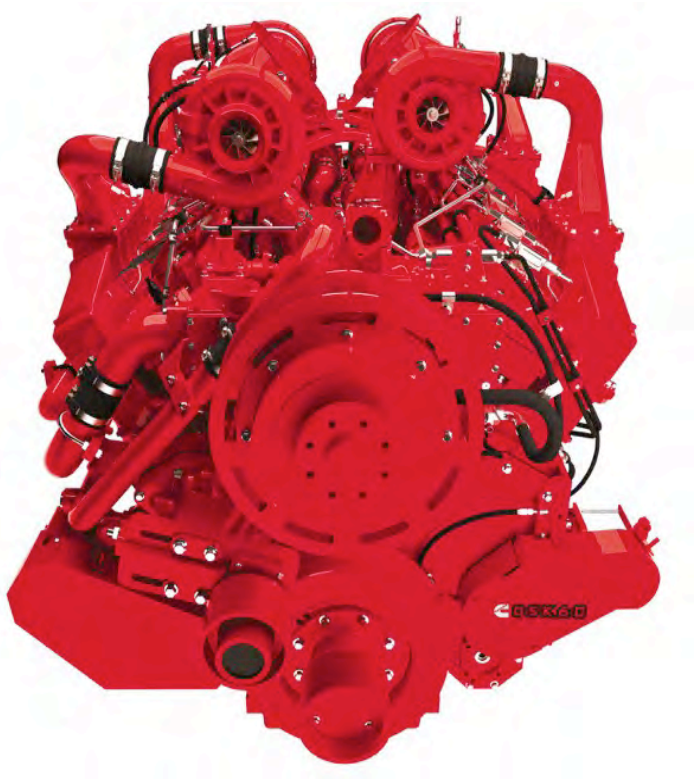
Diesel engine footprint

70%
of the **ENVIRONMENTAL IMPACTS** of a product are determined in the design phase

88%
of Cummins **WATER USE** is from raw material extraction and processing

74%
of Cummins **WASTE** comes from raw material extraction and processing

99%
of Cummins **GHG FOOTPRINT** from products in use



We must change the products we offer, how they are used, and how they are made

Use less, Use better, Use again

The trends are compelling.. It is time to Act!

More than 90% of the world's children breathe toxic air every day.

Extreme weather events have increased more than 5x over same number of decades. Cost of extreme events have increased 8x.

About 4 billion people (two-thirds of the world's population) experience severe water scarcity during at least one month of the year.

1.4 billion pounds of trash wind up in the world's oceans. Plastic expected to outweigh fish in oceans by 2050.

Material consumption has TRIPLED since 1970 and is predicted to increase by 55% in the next decade and DOUBLE by 2050.

PLANET 2050 SET THE DIRECTION AND EXPECTATIONS TO MEET STAKEHOLDER NEEDS

- Making people's lives better by powering a more prosperous world requires a healthier planet.
- PLANET 2050 identified 5 risks that will impact our business and our stakeholders in the future. PLANET 2050 is focused on these five risks:
  - **1) Air pollution**
  - **2) Climate change**
  - **3) Water scarcity**
  - **4) Waste management**
  - **5) Unsustainable material consumption**

Source: https://www.cib.barclays/our-insights/extreme-weather/The-economic-costs-of-extreme-weather.html

Our Story

WHY WE EXIST

OUR MISSION

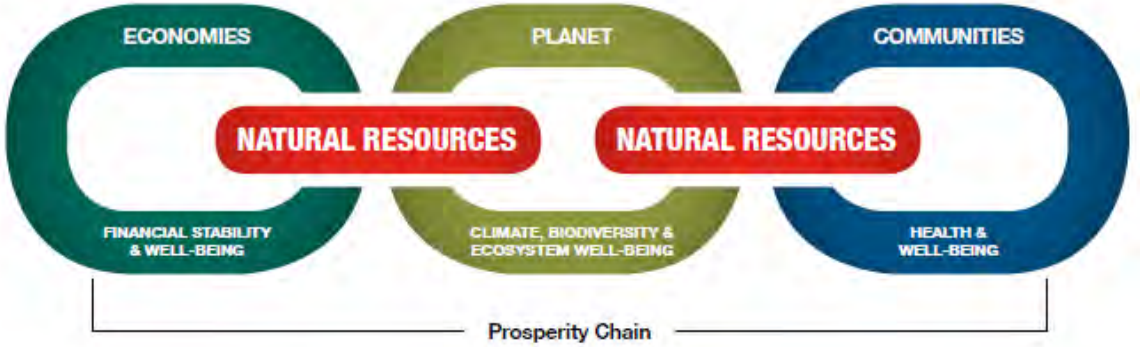
Making people's lives better by powering a more prosperous world

WHAT WE WANT TO ACCOMPLISH

OUR VISION

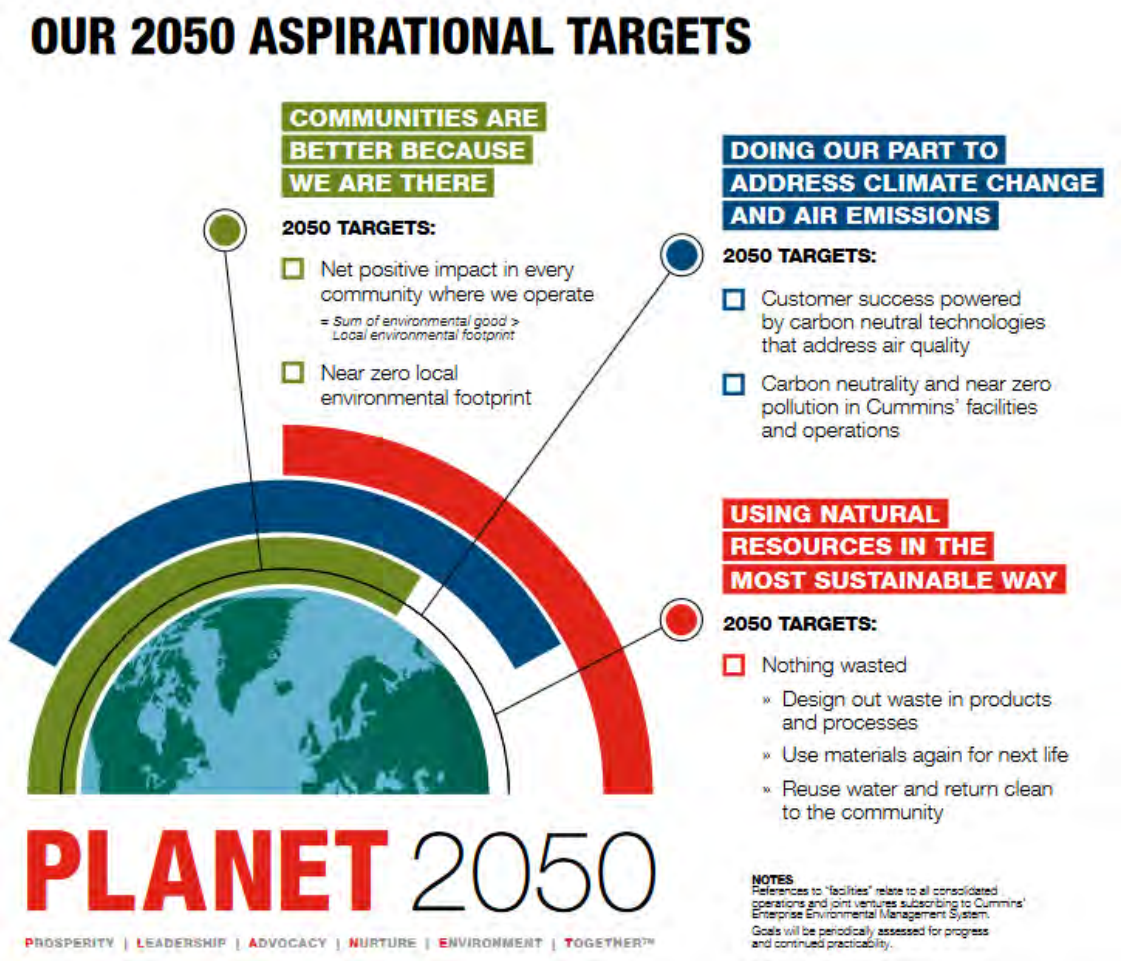
Innovating for our customers to power their success

A prosperous world needs strong communities and economies



….and ***that*** requires a healthier planet

PLANET 2050 Goals



- Net positive impact in every community where we operate
  (= Sum of environmental good > Local environmental footprint)
- Near zero local environmental footprint

- Carbon neutrality
- Near zero pollution

- Nothing wasted
  - Design out waste in products and processes
  - Use materials again for next life
  - Reuse water and return clean to the community

Use less, use better, use again

Our 2030 goals

25%

Generate less waste in facilities and operations as part of revenue

100%

Create a circular lifecycle plan for every part to use less, use better and use again

100%

Reuse or responsibly recycle 100 percent of packaging plastics and eliminate single-use plastics

Using natural resources in the most sustainable way

FROM 2022: TO BE UPDATED

INDIANAPOLIS Circular Economy INITIATIVE

CHALLENGES

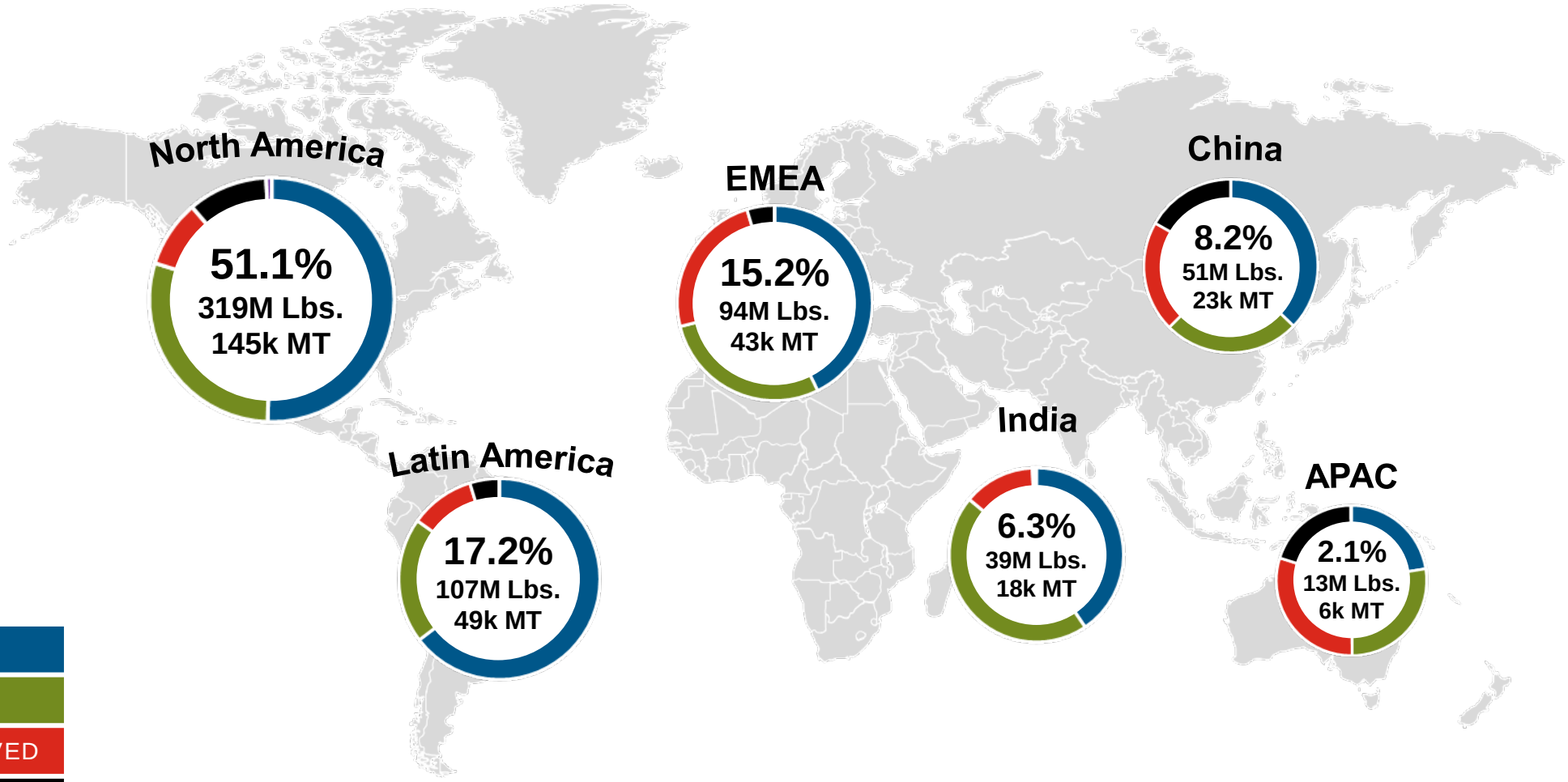
- Indianapolis is **largest city in US** that does not provide curbside recycling to residents[1]
- Indianapolis' recycling rate is 4.3%[2] compared to national average of 35%[3]
- Marion Co. has not increased solid waste fees for 30 years; **basic services are underfunded**
- A Solid Waste Management District for Marion Co. does not exist; therefore resulting in no Marion Co. solid waste management plan and a **lack of consistent public education**
- Indiana's landfill tipping fees, at approximately $45/ton[4], are among the lowest in Midwest; low cost to landfill/incinerate results in **disincentive for waste reduction/diversion**
- Indianapolis has **negative reputation** for environmental ethic, discouraging employers and talent

OUR VISION and OUR PLAN

- We envision a thriving circular economy in Indianapolis and Indiana, where waste is eliminated, resources are captured, and nature is restored
- ICEI currently gathers approximately **30 stakeholders** representing local and statewide perspectives from human services agencies, governmental and non-governmental agencies, arts and culture organizations, neighborhood organizations, businesses, and waste and recycling organizations
- Key deliverables include **Visioning, Education, Advocacy, Job Creation Plan, and Reporting**, occurring over a 3-year period that sets the stage for the **Start-up & Investment** phase

Partners

Regional Waste Footprint – 2022

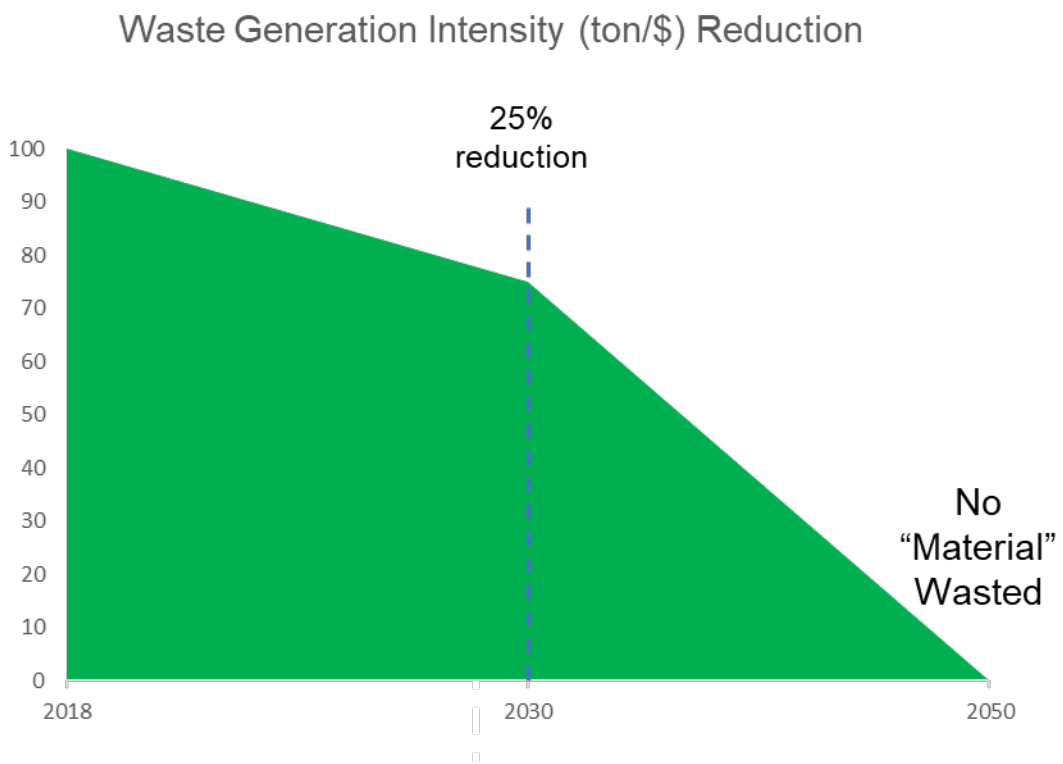


METAL SCRAP
PACKAGING
PROCESS-DERIVED
GENERAL REFUSE
E-WASTE

Boundary: Operational control and fully dedicated 3PLs
In Scope: all day-to-day operational waste streams
Out-of-Scope: C&D, Biohazardous, remediation, residual from supplier processes

PLANET 2050 aims at “No Material Wasted”

What are we trying to achieve?



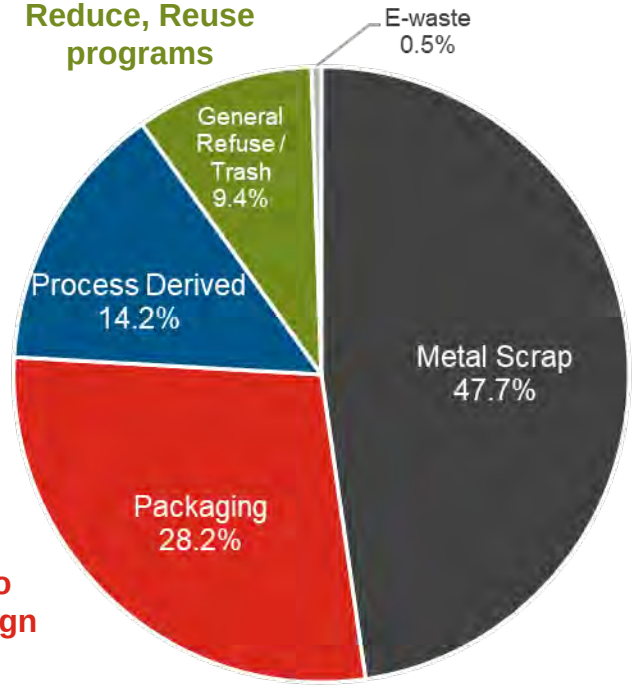
How we plan to achieve it?

Employee engagement, Reduce, Reuse programs

Material efficiency, Industry 4.0 manufacturing practices

Expendable to reusables, design optimization

Design out waste in products and processes



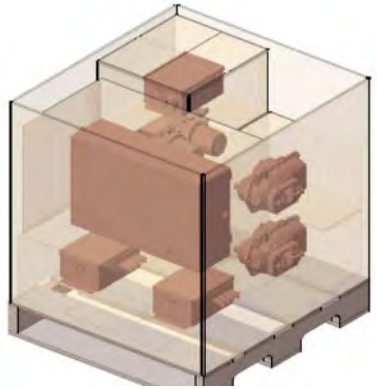
Packaging

Key Work Streams:

1. **Returnable / Reusable Packaging:** Expendable to reusable implementation
2. **Waste Reduction:** Packaging designs that minimize waste, optimize storage & transport
3. **Supply Chain Optimization:** Global portfolio approach to prioritize biggest opportunities

Foundational Work / Wins

- Packaging Data Management System (PDMS) implemented
- Global Packaging Standards
- Strengthening packaging repair / reuse, expanding reusables
- Packaging waste assessment at priority sites in progress
- North America returnable packaging portfolio in development



Manufacturing & Service

Key Work Streams:

1. **Process Improvements**
2. **Technology Improvements**
3. **Utilization of Administrative Controls**
4. **Parts Design:** improved salvageability

Foundational Work / Wins

- Ownership of the goals: Manufacturing engineering leadership
- Identifying and prioritizing waste from all manufacturing (new, remanufacturing, rebuild, upfit)
- 3 years process waste reduction plans in development

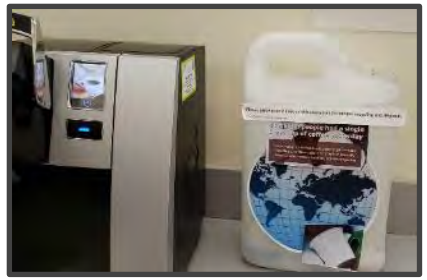
General Refuse & Single Use Plastics

Key Work Streams:

1. **Engagement:** A goal for all employees to reduce the everyday trash
2. **Material Content Selection:** Partner with suppliers on design and material selection
3. **Single Use Plastic free cafes and amenities**

Foundational Work / Wins

- Foundational recycling programs at many facilities – Kick the Can (KTC), Zero Disposal, Standardized recycling stations, signage
- Dumpster Dives to identify opportunities
- Canteen pilot for no-single use plastics at Seymour Engine Plant
- LCA developed comparing different materials and disposition methods

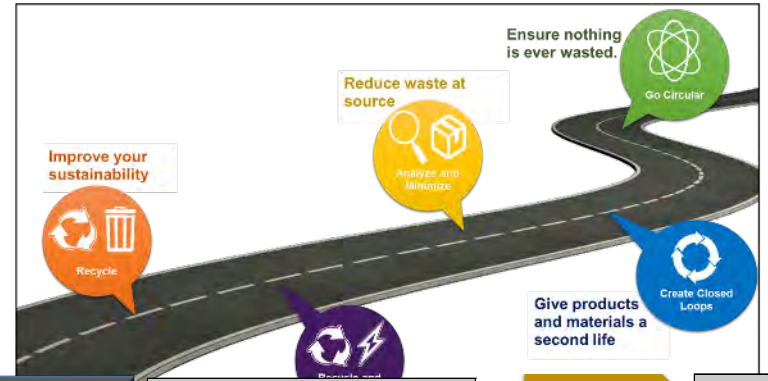


Keys to success

People

Environmental Champions

Tools and Processes



Site Dashboard	Facility Waste Dashboard	STEP 6	Management Opportunities
STEP 1a	Facility Waste Inventory	STEP 7	Waste Project Hopper
STEP 1b	Facility Waste Vendors	STEP 8	Site Objectives & Targets
STEP 2	Waste Requirements (Controls)	STEP 9	SWOT Analysis
STEP 3	Waste Hierarchy	STEP 10	Waste Baseline & EPIs
STEP 4	Waste Stream Significance	STEP 11	Waste Generation Forecast
STEP 5	Packaging Inventory	STEP 12	Waste Hierarchy Project Track

Programs & Initiatives

I'm Sharing

June Environment Month

Globally Envolved
Cummins Environmental News

Innovation Gateway

Waste Review Tool Overview

Waste Recycled - Further Analysis

Waste Streams	Annual Waste Generated	% of Waste Generated	Can you Influence this Waste Stream to move it up the Waste Management Hierarchy? (Reduce, Reuse).	Take Waste Stream Through to Significance Rating
Cast Iron Solids	200,000	40.4%	Yes	Yes
Corrugated Fiberboard	50,000	10.1%	Yes	Yes

	Prioritization:		Revision Date:			02-01-17		
	Please rate the parameters >>		7	5	10	8	9	
Significance No.	Significant Waste Stream	% of Total Waste Generated	Current Management Method:	Waste Stream Quantity	Associated Waste Cost	Environmental Impact / Hazardous Nature	Ability to Influence - Waste Hierarchy	Regulatory Requirements	Total:
1	General Waste	15.2%	Landfilled	9	9	9	9	3	297
2	Wood	30.3%	Burned for Energy	9	9	3	3	9	243

Environmental Theme	Project Leader	Project Description	Project Status
Machinery and Equipment		Chip Compactor	5. Implementing
Machinery and Equipment		Paint System "Paint Changeover" reduction	4. RFA Approved
Waste Reduction (Non-packaging)		Filter press improvements for sludge elimination	6. Completed
Recycling Program Improvement (Non-packaging)		Standardised waste segregation infrastructure	6. Completed

Complete detailed waste inventory
Include details like area of generation, disposition method, residual management, etc.

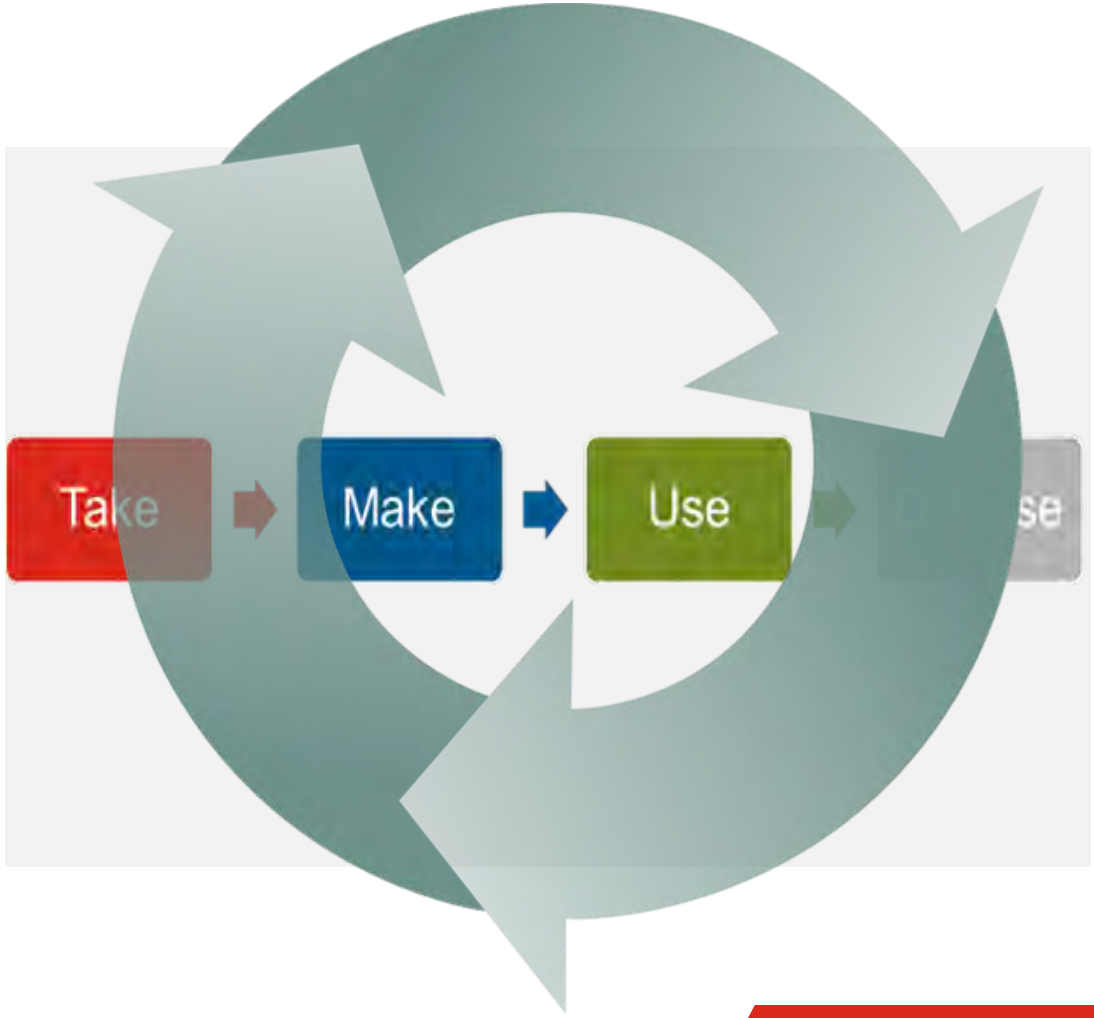
Identify top streams in waste hierarchy *and take them through to score and identify the most significant waste streams*

Complete detailed packaging waste assessment *at packaging priority sites*

Evaluate management opportunities to move waste up the hierarchy *and launch projects*

Circular Economy

Approach



What is Circular Economy?

Definition:

A circular economy is a system which maintains the value of products, materials and resources in the economy for as long as possible and minimizes the generation of waste. This means a system where products are reused, repaired, remanufactured or recycled. [Circular economy - EUR-Lex (europa.eu)]

Benefit:

- Using natural resources in most sustainable way
- Cost reduction, savings, business growth
- Reduce raw material dependence - Mitigates the risks associated with supply, such as price volatility, availability and import dependency.

Cummins Circular Economy Approach

DESIGN & VALIDATION OF TECHNOLOGY

- **Design out waste** and pollution
- Improve product hot test efficiency
- Increase **sustainable materials and coatings**
- **Design for Repair, Rebuild, Remanufacturing**

MATERIALS

- Only **use what is needed** with parts that have lowered embodied energy
- Use **renewable resources**, recycled materials, and sustainable partners

PRODUCTION

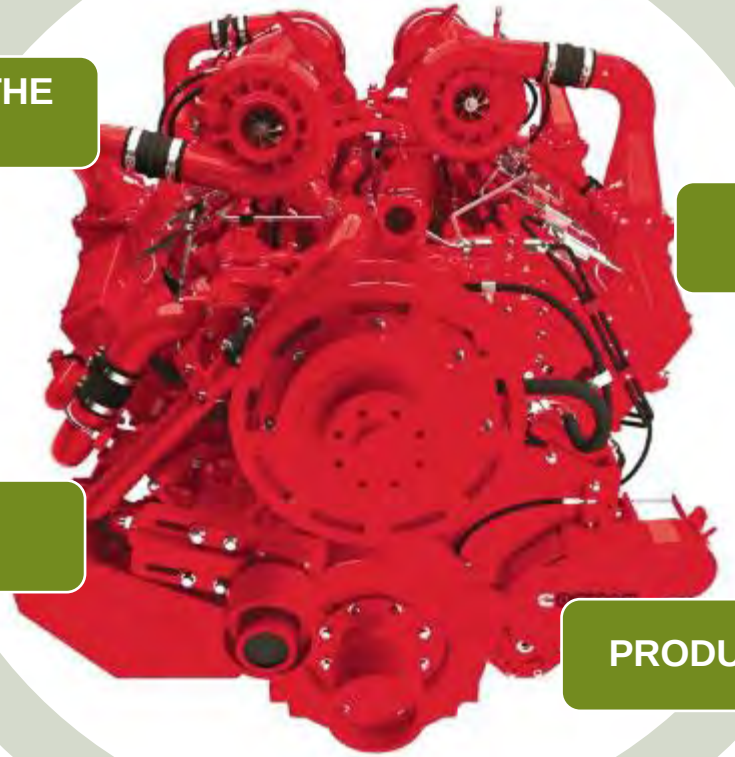
- **Returnable, Reusable packaging**
- Reduce **manufacturing scrap**, **process waste** and **packaging plastics**
- Reduce water use, increase reuse
- Reduce energy use, increase renewable energy opportunities
- Eliminate pollution/VOC from operations
- **Responsible recycling & recovery**

USE

- **Fuel efficient** products
- **Carbon neutral** technologies that address air quality
- Keep products and materials in **use longer**

CLOSING THE LOOP

- Extend lifetime of resources through **reuse, repair, rebuild, remanufacture**
- **Responsible recycling & recovery**
- Other Beneficial Use



Remanufacturing at Cummins

- Products
  - Engines and engine sub-assemblies
  - Parts – turbos, injectors, pumps, electrics...
  - Soon – other powertrain, batteries…
- Scale
  - 70 million lbs. of core processed
  - 10 million units sold
- Value Proposition


Exchanged Core

+


Advanced Technology

+

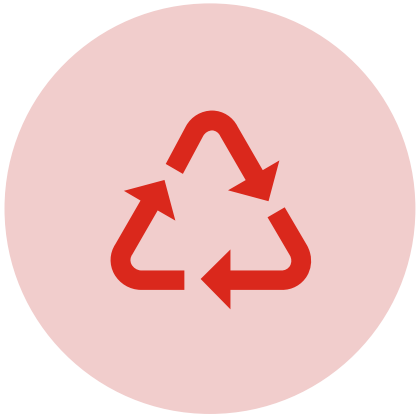

Genuine Parts

+


Factory Quality

- Like new performance
- Like new warranty
- Same sales & support network
- Value price

Summary: Circular Economy Strategy



WHAT MAKES A PRODUCT CIRCULAR?

Determine Requirements

HOW MUCH SUSTAINABLE ?

Identify criteria

WHAT IS THE ROBUSTNESS TO SUPPLY CHAIN DISRUPTIONS?

Enable value


Cummins